



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,106	11/17/2003	Harue Nakashima	0553-0382	3243

7590 03/08/2007
COOK, ALEX, McFARRON, MANZO
CUMMINGS & MEHLER, LTD.
SUITE 2850
200 WEST ADAMS STREET
CHICAGO, IL 60606

EXAMINER

GARRETT, DAWN L

ART UNIT	PAPER NUMBER
----------	--------------

1774

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/715,106

Applicant(s)

NAKASHIMA ET AL.

Examiner

Dawn Garrett

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-6 and 10-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-6 and 10-39 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 July 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1-12-2007.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 12, 2007 has been entered.
2. The amendment filed January 12, 2007 has been entered. Claims 1-3 and 7-9 are canceled. Claims 4, 5, 11, 12, 19, 20, 27, 28, and 36-39 were amended. Claims 4-6 and 10-39 are pending.
3. The rejection of claims 4, 5, and 36-39 under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 6,680,132) is withdrawn due to the amendment.
4. The rejection of claims 11-35 under 35 U.S.C. 103(a) as being unpatentable over Shi et al. (US 6,680,132) is withdrawn due to the amendment.
5. The previous indication of claim 6 as allowable is withdrawn.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
7. Claim 35 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 1774

Claim 35 recites "the metal represented by the general formula [Formula 2]" in two occurrences. This phrase is indefinite, because formula 2 represents a metal complex not a metal. Accordingly it is unclear if the limitations of claim 35 are drawn to only the metal of the metal complex or if the entire metal complex is intended. Clarification and/or correction are required.

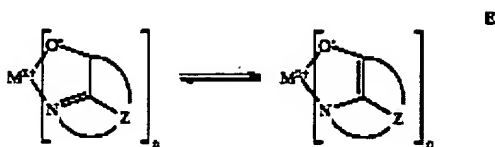
Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 4-6, 10, 27-34, 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakagawa et al. (US 2004/0124766 A1) in view of Shi et al. (US 6,680,132). Nakagawa et al. teaches organic electroluminescent devices comprising a substrate, anode, light emitting layers, and cathode (see abstract). The device comprises red, green and blue light emitting layers (see par. 142-154). The host for the red light emitting layer and the green light emitting layer may both be formed of a quinolinolato-based metal complex (see par. 162). Nakagawa et al. does generally teach quinolinolato-based metal complexes, but fails to teach the specific quinolinolato metal complexes of the present claims. Shi et al. teaches in analogous art a red light emitting layer for an electroluminescent device comprising metal complexes such as chelated oxinoid compounds (also known as quinoline compounds) (see col. 8, lines 46-67) including the following formula (see col. 8, lines 5-27) for the host material:

Art Unit: 1774



wherein

M represents a metal;

n is an integer of from 1 to 4; and

Z independently in each occurrence represents the atoms completing a nucleus having at least two fused aromatic rings.

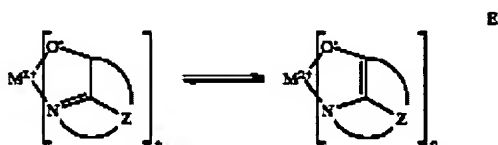
Since M represents a metal, this teaching encompasses Ti, Zr, Hf and Rf of Group IV and more specifically, Shi et al. clearly mentions “Zirconium oxine” at col. 8, lines 66-67. The ligand required by the instant claims is clearly taught by Shi et al. (see all of col. 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the host compound taught by Shi et al. for the Nakagawa et al. host material for the red and green emitting layers, because Nakagawa et al. teaches such a compound is desirable as the host.

The dopants for the red emitting layer include red emitting DCJTb and DCM (see par. 160).

10. Claims 11-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakagawa et al. (US 2004/0124766 A1) in view of Shi et al. (US 6,680,132) in further view of Kim et al. (US 6,614,176). Nakagawa et al. teaches organic electroluminescent devices comprising a substrate, anode, light emitting layers, and cathode (see abstract). The device comprises red, green and blue light emitting layers (see par. 142-154). The host for the red light emitting layer and the green light emitting layer may both be formed of a quinolinolato-based metal complex (see par. 162). Nakagawa et al. does generally teach quinolinolato-based metal complexes, but fails to teach the specific quinolinolato metal complexes of the present claims. Shi et al. teaches

Art Unit: 1774

in analogous art a red light emitting layer for an electroluminescent device comprising metal complexes such as chelated oxinoid compounds (also known as quinoline compounds) (see col. 8, lines 46-67) including the following formula (see col. 8, lines 5-27) for the host material:



wherein

M represents a metal;

n is an integer of from 1 to 4; and

Z independently in each occurrence represents the atoms completing a nucleus having at least two fused aromatic rings.

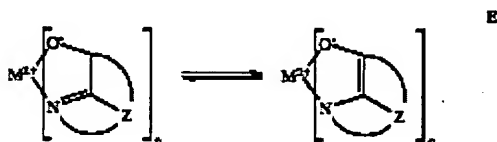
Since M represents a metal, this teaching encompasses Ti, Zr, Hf and Rf of Group IV and more specifically, Shi et al. clearly mentions “Zirconium oxine” at col. 8, lines 66-67. The ligand required by the instant claims is clearly taught by Shi et al. (see all of col. 8). It would have been obvious to one of ordinary skill in the art at the time of the invention to have selected the host compound taught by Shi et al. for the Nakagawa et al. host material for the red and green emitting layers, because Nakagawa et al. teaches such a compound is desirable as the host.

The dopants for the red emitting layer include red emitting DCJTb and DCM (see par. 160). Nakagawa et al. discloses DCM-type derivatives, but fails to teach the specific red-emitting DCM derivatives DCM1 and DCM2. Kim et al. teaches in analogous art useful dopants for a light emitting layer comprising DCM1 (Kim et al. sets forth this compound as “DCM”), and DCM2 (see col. 3 and 4). It would have been obvious to one of ordinary skill in the art to have selected the DCM derivatives taught by Kim et al. for the Nakagawa et al. device, because Kim et al. teaches the DCM derivatives as suitable dopants for a light emitting device. One would

Art Unit: 1774

have expected the DCM derivatives to be similarly useful in the Nakagawa et al. device, especially since Nakagawa et al. disclose other DCM-type derivatives as suitable for their devices.

11. Claims 36-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peng (US 20040046495) in view of Shi et al. (US 6,680,132). Peng discloses an organic electroluminescent device emitting full color light and having three different light emitting layers. Each light emitting layer comprises a host and a guest material (see abstract and Fig. 3). Peng fails to teach specifically a red light emitting layer having the specific host material according to formula 1 in claim 26. Shi et al. teaches in analogous art a red light emitting layer for an electroluminescent device comprising metal complexes such as chelated oxinoid compounds (see col. 8, lines 46-67) including the following formula (see col. 8, lines 5-27) for the host material:



wherein

M represents a metal;

n is an integer of from 1 to 4; and

Z independently in each occurrence represents the atoms completing a nucleus having at least two fused aromatic rings.

Since M represents a metal, this teaching encompasses Ti, Zr, Hf and Rf of Group IV and more specifically, Shi et al. clearly mentions “Zirconium oxine” at col. 8, lines 66-67. The ligand required by the instant claims is clearly taught by Shi et al. (see all of col. 8).

It is noted in claim 36 that only one light emitting layer requires the formula 1 compound.

Art Unit: 1774

Allowable Subject Matter

12. Claim 35 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. If claim 35 is clarified to recite the metal complex as both a host in one light emitting layer and a guest in another light emitting layer, the claim would comprise allowable subject matter. The closest prior art is considered to be the references discussed in this office action. The references do not render obvious using a compound according to formula 2 as both a host in one light emitting layer and a guest in another light emitting layer.

Response to Arguments

13. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dawn Garrett whose telephone number is (571) 272-1523. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena Dye can be reached on (571) 272-3186. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1774

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Dawn Garrett
Primary Examiner
Art Unit 1774

March 2, 2007